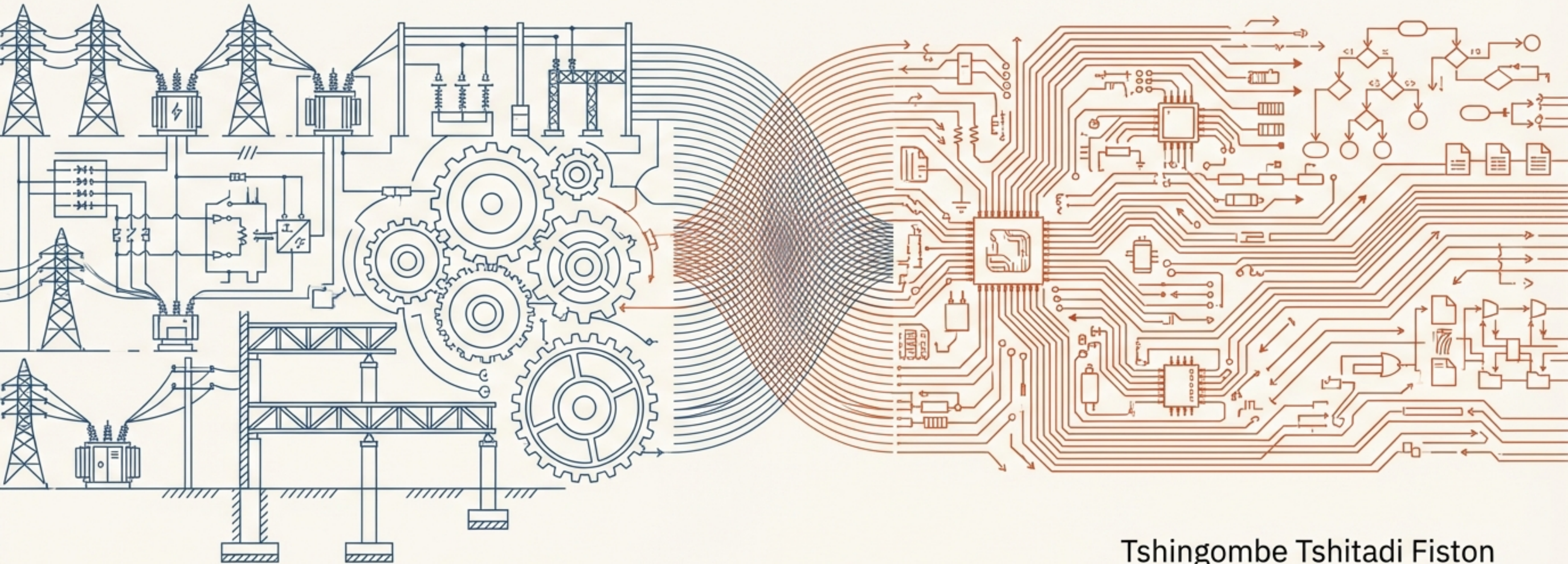


The Convergence Challenge: Securing the Seams Between Physical Infrastructure and Digital Intelligence

A portfolio of evidence demonstrating a multidisciplinary approach to engineering the resilient systems of the future



Tshingombe Tshitadi Fiston

An Architected Skillset for a Complex World

The following portfolio is structured across four integrated pillars of expertise. Each pillar represents a critical domain, and together, they form a comprehensive toolkit for addressing the challenges at the intersection of energy, manufacturing, software, and security.



Pillar I:
Mastery of
Physical & Power
Systems



Pillar II:
Engineering
the Digital Layer



Pillar III:
Architecting
for Resilience &
Security



Pillar IV:
Integrating
Future-Forward
Solutions

Pillar I: Mastery of Physical & Power Systems

From First Principles of Electrotechnology to Complex Industrial Systems.

Key Competencies

- **Advanced Power Systems:** Analysis of AC/DC machines, high voltage engineering, smart grids, and renewable energy systems integration.
- **Industrial Engineering & Manufacturing:** Deep knowledge of production management, factory layout, mechanization, and quality control, including processes like soldering, welding, and surface finishing.
- **Civil & Infrastructure Engineering:** Application of engineering principles to construction, including nodal analysis for structural support and material science.

Visual Evidence

Applied Thermodynamics

$$h_{\text{plant}} = \frac{m_s(h_4 - h_1)}{m_f \times h_v} \times \frac{\times 100}{1} = \frac{5400(3148 - 188)}{600 \times 3200 \times 100} = 83,25\%$$

Circuit Component Specification

Project: PIR-triggered main switch.
Components: 2M3x15mm nylon screw, 3-core mains flex (250v, 10A), relay contact rated 20A.

Complex Vector & Differential Equations

$$\text{Integral } \int_{b..a}^{b..a} \sqrt{1 + (Dy)(Dy) \div dx()} \dots dx$$

Pillar II: Engineering the Digital Layer

Building and Managing the Software, Data, and Intelligence that Powers Modern Systems.

Key Competencies

- **Software & Network Engineering:** Design, testing, implementation, and support of software systems; network planning, deployment, and optimization.
- **Data Systems & Architecture:** Expertise in database management (Oracle, SAP), immutable data storage solutions, and data analytics.
- **Artificial Intelligence & Machine Learning:** Proven ability to build, train, and evaluate AI solutions using cloud platforms and modern techniques.

ICT Occupation Skillset

“software engineer design modified documents test implementation installation software support with .”

AI Skills Challenge: Microsoft Azure OpenAI



Get started with Azure OpenAI Service



Apply prompt engineering with Azure OpenAI Service



Implement Retrieval Augmented Generation (RAG)



Perform vector search and retrieval in Azure AI Search



Train and evaluate deep learning models

Pillar III: Architecting for Resilience & Security

Integrating Security from the Ground Up: From Cyber-Physical Systems to Distributed Ledgers.

Key Competencies

- **Cybersecurity Operations:** Expertise in threat vector analysis, vulnerability management, incident response, and implementing security policies for critical infrastructure like digital libraries and smart grids.
- **Risk & Compliance:** Proposed research for ISC2 Security Congress on Governance, Risk, and Compliance (GRC) and the “stability design, projection system trade marketing board.”
- **Distributed Ledger Technology (DLT):** In-depth study of DLT applications for secure credentialing, smart contracts in transactions, and ensuring data privacy.

Visual Evidence

Cyber-Physical Systems Security

- CPS Security and Privacy
- Real-Time Systems and CPS
- Simulation and Modeling in CPS

Secure Digital Infrastructure

- Threats and Vulnerabilities in Digital Libraries
- Digital Rights Management
- Access Control in Library Networks

Certificate Authority Detail

Signature algorithm:sHS - 256ECDsa

Pillar IV: Integrating Future-Forward Solutions

Proactively Mastering Emerging Technologies to Solve Tomorrow's Intractable Problems.

Key Competencies

- **Quantum Computing:** Exploration of quantum algorithms, gates, and programming languages for application in complex systems engineering optimization problems.
- **Autonomous Systems:** Advanced studies in autonomous vehicles and drones, including sensor technologies, ML/AI control systems, and renewable energy integration.
- **Synthetic Biology & Advanced Manufacturing:** Study of genetic engineering (CRISPR), biopharmaceutical manufacturing, and applications in vertical farming and urban agriculture.
- **Clean Energy Technology:** Focus on ecotechnology applications including solar, wind, and bioenergy systems.

Future-Focused Research Topics

**Quantum Computing
in Systems
Engineering**



**Advanced Studies in
Autonomous Vehicles
and Drones**



**Advanced
Manufacturing
Techniques in Genetic
Engineering**



**Clean Energy
Technology:
Ecotechnology
Applications**



**Fundamentals of
Synthetic Biology**



Synthesis: A Unified Framework for Designing Secure and Intelligent Infrastructure

How do we engineer a truly resilient, efficient, and secure national smart grid?



Solving this requires more than a single specialty; it demands the seamless integration of all four pillars.

A Persistent Search for Problems Worth Solving.

A documented journey of seeking roles at the intersection of critical infrastructure, technology, and security—engaging with leading organizations in energy, public safety, and enterprise technology. This was not a search for just any job, but for the right challenge.



Job Reference: Snr Advisor SDL&IPL

Re Advert Snr Draughtsperson Draughting Electrical Substation Engineering

Post: [REDACTED]
Details: [REDACTED]



Request an intellectual property (IP) licence

Post: [REDACTED]
Details: [REDACTED]

Vacancy: 18067 - Dev Ops Engineer (Cloud Platform) - Counter Terrorism Policing HQ

Post: [REDACTED]
Details: [REDACTED]



Thank you for your interest in the position of Senior Applied AI Engineer , 1762298 at this time.



Application Unsuccessful

Update on your Job application with SARB

Post: [REDACTED]
Details: [REDACTED]



Course Title: Training Program in Smart Grid Solutions and Power Management

Post: [REDACTED]
Details: [REDACTED]

Course Title: Training Program in Smart Grid Solutions and Power Management

Document header: [REDACTED]
[REDACTED]
[REDACTED]

From Theory to Tangible Application: A Selection of Experimental Projects

Mains Power Outage Monitor

Objective:

Design a circuit to constantly monitor mains power and signal outages, preventing depletion of backup batteries for home alarm systems.

Technical Details:

Implemented a delay/tolerance time to avoid false alarms. Digital version tracks mains interruptions, duration, and total outage time. Utilizes a PIC16F1827 microcontroller and a 1.5F supercapacitor for backup power.

```
case Mode_TOL: // Waiting ttol time
...
if (POWER == 1) { Mode = Mode_SBY; }
else { ... SetAlm(); }
```

Reflow Soldering Oven Controller

Objective:

Develop a controller for a PCB reflow oven with precise temperature management and automated operation.

Technical Details:

Temperature range: 25-300°C.
Max PCB size: 400x285mm.

Uses ATmega88 with 8MHz internal oscillator. Features interactive USB command interface and automatic drawer opening.

CPU frequency: 8Mhz | Sleep mode: Non. | Current drawn: 5.8mA

Speed Control of a Brushed DC Motor

Objective:

Create a motor controller that maintains constant speed regardless of torque, using EMF measurement instead of a tachogenerator.

Technical Details:

Software written in BASCOM for ATtiny45.

Operates in 'Phase Correct PWM Timer' mode. Measures speed in the switch-off phase after demagnetization to calculate EMF.



A Curriculum of Continuous Learning: Formal Education & Certifications

University & Post-School Education

Atlantic International University

- Doctorate & Masters study outlines in Specialist Engineering Infrastructure, Electrical Engineering, etc.

Pearson Institute of Higher Education

- Accreditation: DHET reg Certificate No: 2004/HE7/004
- Framework: NATED (N1-N6), NCV, SAQA, QCTO alignment.

Key Professional Certifications & Training



Microsoft

- AI Skills Challenge: Build next generation apps with Azure OpenAI
- SQL Server Migration & Optimization



ISC2

- Call for Papers Proposal: Security Congress 2025
- Study of CISSP-ISSMP domains



Schneider Electric

- Sustainability School
- Secure Power solutions for data centers
- Digital Power solutions



Alison

- Advanced Diploma in Basics of Electrical Technology
- Diploma in Electrical Technology
- Engineering Project Management

Research & Publications

F1000Research

- Article submission 161981

Thesis Proposal

- Proposal of thesis content 2 final research(2).docx

Research Areas

B2B e-commerce for electric power, AI-powered product recommendations, rural electrification with PV solar.

The Interdisciplinary Engineer

The challenges of our interconnected world will not be solved by siloed expertise. They require a systems-level understanding, a fluency across physical and digital domains, and a relentless drive to integrate emerging technologies. This portfolio is the foundation for that work.



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